What is claimed is:

1. An authentication system comprising:

direction measuring means for measuring, in a time domain, the direction vector of a pen represented by a tilt angle or direction angle of the pen with respect to a writing surface;

first vector generating means for generating, in a time domain, a first vector including, as a component thereof, the direction vector of the pen measured by said direction measuring means when a first entity writes a predetermined pattern on the writing surface with the pen;

second vector generating means for generating, in a time domain, a second vector including, as a component thereof, the direction vector of the pen measured by said direction measuring means when a second entity writes said predetermined pattern on the writing surface with the pen;

DP matching means for performing a DP matching process to match time scales of the first and second vectors in order to minimize an accumulated value of differences between the first vector generated by said first vector generating means and the second vector generated by said second vector generating means, said differences including differences between the direction vector included in said first vector and the direction vector included in said second vector; and

decision means for determining that said first
entity and said second entity are identical to each other
if the accumulated value of differences between the first
vector and the second vector in said DP matching process
performed by said DP matching means is equal to or smaller
than a predetermined threshold, and determining that said
first entity and said second entity are different from each
other if said accumulated value is greater than said prede-
termined threshold.

2. An authentication system according to claim
1, further comprising:

pen tip position measuring means for measuring,
in a time domain, the position vector of the tip of said
pen on said writing surface, or writing pressure measuring
means for measuring, in a time domain, the writing pressure
applied to said writing surface by said pen;

said first and second vector generating means
comprising means for generating, in a time domain, first
and second vectors, respectively, which include, as a com-
ponent thereof, the position vector measured by said pen
tip position measuring means or the writing pressure meas-
ured by said writing pressure measuring means;

said DP matching means comprising means for de-
termining said differences between said first and second
vectors by standardizing the differences between the direc-

tion vector included in said first vector and the direction vector included in said second vector and differences between the position vector or writing pressure included in said first vector and the position vector or writing pressure included in said second vector, weighting the standardized differences, and adding the weighted differences when the DP matching process is performed on said first and second vectors by said DP matching means.

3. An authentication system according to claim 2, wherein said DP matching means comprises means for determining said differences between said first and second vectors by standardizing the differences between the direction vector included in said first vector and the direction vector included in said second vector and the differences between the position vector or writing pressure included in said first vector and the position vector or writing pressure included in said second vector, weighting the standardized differences such that the former differences are weighted to an extent greater than the latter differences, and adding the weighted differences when the DP matching process is performed on said first and second vectors by said DP matching means.

4. An authentication system according to claim 1, further comprising:

pen tip position measuring means for measuring, in a time domain, the position vector of the tip of said pen on said writing surface; and

writing pressure measuring means for measuring, in a time domain, the writing pressure applied to said writing surface by said pen;

said first vector generating means and said second vector generating means comprising means for generating, in a time domain, first and second vectors, respectively, which include said position vector and said writing pressure as components thereof;

said DP matching means comprising means for determining said differences between said first and second vectors by standardizing the differences between the position vector included in said first vector and the position vector included in said second vector and the differences between the writing pressure included in said first vector and the writing pressure included in said second vector, weighting the standardized differences such that the former differences are weighted to an extent greater than the latter differences, and adding the weighted differences when the DP matching process is performed on said first and second vectors by said DP matching means.

5. An authentication system according to any one of claims 1 through 4, wherein said first vector generating

means comprises means for generating, in a time domain, a plurality of sets of the first vector when said first entity writes said predetermined pattern on said writing surface a plurality of times, said DP matching means comprising means for performing the DP matching process on said plurality of sets of the first vector, and said first vector generating means comprising means for generating, in a time domain, an average vector of the plurality of sets of the first vector processed by the DP matching process as a new first vector.

6. An authentication system according to claim 5, wherein said threshold is substantially the same as a maximum value of the accumulated value of the differences in the DP matching process performed on the plurality of sets of the first vector.

7. An authentication system according to claim 1, 2, 3, 4 or 6 wherein said second vector generating means comprises means for generating, in a time domain, a plurality of sets of the second vector when said second entity writes said predetermined pattern on said writing surface a plurality of times, said DP matching means comprising means for performing the DP matching process on said plurality of sets of the second vector, and said second vector generating means comprising means for generating, in a time do-

main, an average vector of the plurality of sets of the second vector processed by the DP matching process as a new second vector.

8. An authentication system according to claim 5, wherein said second vector generating means comprises means for generating, in a time domain, a plurality of sets of the second vector when said second entity writes said predetermined pattern on said writing surface a plurality of times, said DP matching means comprising means for performing the DP matching process on said plurality of sets of the second vector, and said second vector generating means comprising means for generating, in a time domain, an average vector of the plurality of sets of the second vector processed by the DP matching process as a new second vector.